

Claims

1. A monitor for tongs that undergoes a rotational action to provide a tightening action, comprising:

5 a sensor adapted to be coupled to the tongs and being adapted to provide an input signal in response to the tightening action of the tongs;

an input electrically coupled to the sensor; and

10 an electrical circuit electrically coupled to the input for receiving the input signal, wherein the electrical circuit includes a learning mode in which a target tightness value is determined based on the input signal, and wherein the electrical circuit includes a monitoring mode in which the input signal is compared to the target tightness value.

15 2. The monitor of claim 1, wherein the sensor is a pressure sensor adapted to be in fluid communication with the tongs.

20 3. The monitor of claim 1, wherein the sensor is a counter adapted to detect the rotational action of the tongs.

4. The monitor of claim 1, wherein the sensor includes an electrical current sensor.

25 5. The monitor of claim 1, wherein the target tightness value is based on torque exerted by the tongs.

30 6. The monitor of claim 1, wherein the target tightness value is based on rotational displacement associated with the tongs.

7. The monitor of claim 1, further comprising an output electrically coupled to the electrical circuit, wherein the electrical circuit provides at the output an output signal in response to the input signal being within a predetermined range of the target tightness value.

8. The monitor of claim 7, wherein the output signal is visible.

9. The monitor of claim 7, wherein the output signal is audible.

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15 10. The monitor of claim 7, wherein the output signal is provided in response to the input signal being within a predetermined range of the target tightness value for a predetermined time delay.

20 11. A monitor for tongs that undergoes a rotational action to provide a tightening action for sequentially tightening a first joint and a second joint, comprising:

a sensor adapted to be coupled to the tongs and being adapted to provide a first input signal in response to the tongs tightening the first joint, and being adapted to provide a second input signal in response to the tongs tightening the second joint;

25 an input electrically coupled to the sensor;

an electrical circuit electrically coupled to the input for receiving the first input signal and the second input signal, wherein the electrical circuit includes a learning mode in which a target tightness value is determined based on the first input signal, and wherein the electrical circuit includes a monitoring mode in which the second input signal is compared to the target tightness value; and

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an output electrically coupled to the electrical circuit, wherein the electrical circuit provides at the output an output signal in response to the second input signal being within a predetermined range of the target tightness value.

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12. The monitor of claim 11, wherein the sensor is a pressure sensor adapted to be in fluid communication with the tongs.

10 13. The monitor of claim 11, wherein the sensor is a counter adapted to detect the rotational action of the tongs.

14. The monitor of claim 11, wherein the sensor includes an electrical current sensor

15 15. The monitor of claim 11, wherein the target tightness value is based on torque exerted by the tongs.

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16. The monitor of claim 11, wherein the target tightness value is based on rotational displacement associated with the tongs.

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17. The monitor of claim 1, wherein the output signal is visible.

18. The monitor of claim 1, wherein the output signal is audible.

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19. The monitor of claim 1, wherein the output signal is provided in response to the second input signal being within a predetermined range of the target tightness value for a predetermined time delay.

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20. A method of monitoring the tightening a plurality of joints after tightening a first joint, comprising:

tightening the first joint;

determining a target tightness value by monitoring the tightening of the first joint;

10 tightening the plurality of joints; and

comparing to the target value an extent to which each joint of the plurality of joints is tightened .

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